Exam #1 · Tuesday Sep. 13, 2005

MATH 110 · Section 10 · Fall 2005 Name _____

1. Which of the following tables determine y as a function of x?

(1)

x	1	2	3	4
y	-1	0	-1	1

(2)

x	0	2	4	2
y	2	7	-6	4

(3)

x	5	4	2	1
y	4	4	4	4

(A) 3 only (B) 1 and 2 only (C) 2 and 3 only
(D) 1 and 3 only (E) All of them

2. Which of the following tables determine x as a function of y?

(1)

y	-1	0	-1	1
x	1	2	3	4

(2)

y	2	7	-6	4
x	0	2	4	2

(3)

y	4	4	4	4
x	5	4	2	1

(A) 1 and 2 only (B) 1 only (C) 2 only
(D) All of them (E) None of them

3. Which of the following equations determine y as a function of x?
(1) $y = x + 1$ (2) $y^2 = x + 1$ (3) $y^3 = x + 1$
(Hint: For each of these curves, how many y's lie on the curve at $x = 0$? What about at other values of x?)

(A) All of them (B) 1 and 2 only (C) 3 only
(D) 1 and 3 only (E) 2 and 3 only

4. Which of the following graphs represent y as a function of x?

(Graph 1) (Graph 2) (Graph 3)

(A) All of them (B) 1 and 3 only (C) 3 only
(D) 1 and 2 only (E) 2 and 3 only

5. Find the domain and zero(s) of the function $f(x) = \sqrt{x-5}$.

6. Find the domain and zero(s) of the function $f(x) = x^2 + 3x + 2$.

7. Find the domain and zero(s) of the function $f(x) = \frac{x+5}{x^2+4x+4}$.

8. Find the domain and range of the following function:

9. Determine the x-intercept(s) and y-intercept(s) of the following function:

10. Using the space provided below, graph the function

$$f(x) = \begin{cases} 2 & x < -1 \\ |x| & -1 \leq x < 2 \\ -x & x \geq 2 \end{cases}$$

11. Let $f(x)$ be given by the following graph:

(a) Determine the turning points of the function.

(b) Determine the intervals on which the function is increasing.

(c) Determine the intervals on which the function is decreasing.

12. Let

$$f(x) = \begin{cases} |x| & x < -1 \\ 3 & -1 \le x < 1 \\ x - 2 & x \ge 1 \end{cases}$$

Part (a). Evaluate $f(-2)$.

Part (b). Evaluate $f(-1)$.

Part (c). Evaluate $f(3)$.

13. Which of the following formulas extends the function

$$f(x) = \{x^2 - x - 1 \qquad x > 0$$

to make it an odd function defined on all real numbers?

(a) $f(x) = \begin{cases} x^2 - x - 1 & x > 0 \\ 0 & x = 0 \\ x^2 + x + 1 & x < 0 \end{cases}$ (b) $f(x) = \begin{cases} x^2 - x - 1 & x > 0 \\ 0 & x = 0 \\ x^2 - x - 1 & x < 0 \end{cases}$

(c) $f(x) = \begin{cases} x^2 - x - 1 & x > 0 \\ 0 & x = 0 \\ -x^2 + x + 1 & x < 0 \end{cases}$ (d) $f(x) = \begin{cases} x^2 - x - 1 & x > 0 \\ 0 & x = 0 \\ -x^2 - x - 1 & x < 0 \end{cases}$

(e) None of these.

14. You begin a business with initial funds of \$1,000,000. Your business is losing money at the rate of \$40,000 per day.

    (a) Sketch a graph of your funds as a function of time.

    (b) Describe the significance of the x and y intercepts of this function.

15. You have chosen a certain make and model of vehicle to rent. Fuel costs \$0.12 per mile for this make and model of vehicle. Company A rents the vehicle for \$25 per day plus \$0.10 per mile. Company B rents the vehicle for \$30 per day plus \$0.08 per mile. Thus, your total cost renting from company A is \$25 per day plus \$0.10 per mile plus \$0.12 per mile, while your total cost renting from company B is \$30 per day plus \$0.08 per mile plus \$0.12 per mile. (Both companies permit one-way trips at no extra expense.)

    (a) Find the cost per mile for a day trip, including fuel, using a vehicle from company A, as a function of the number of miles driven.

(b) Find the cost per mile for a day trip, including fuel, using a vehicle from company B, as a function of the number of miles driven.

(c) Suppose Phoenix is 120 miles away and can be reached in a day. For which choice of company will you obtain a lower cost?

(d) Suppose San Diego is 400 miles away and can be reached in a day. For which choice of company will you obtain a lower cost?